CLAIMS

1. A composite drive shaft fabrication apparatus comprising:

at least one elongated stiffening mold member; and

a cylindrical mold having at least one receiving groove parallel to its central axis, said receiving groove designed to receive said elongated stiffening mold member.

2. The apparatus of claim 1, wherein said receiving grooves are arranged equidistantly along the circumference of said drive shaft.

3. The apparatus of claim 1, wherein said elongated stiffening mold members and associated receiving grooves have a hat shape.

4. The apparatus of claim 1, wherein said elongated stiffening mold members and associated receiving grooves have a T shape.

5. The apparatus of claim 1, wherein said elongated stiffening mold members and associated receiving grooves have a circular shape.

6. The apparatus of claim 1, wherein said elongated stiffening mold members are removable from the drive shaft to leave structural voids.

7. The apparatus of claim 1, wherein said elongated stiffening mold members and their associated receiving grooves extend longitudinally through the full length of the cylindrical mold.

8. The apparatus of claim 1, wherein said elongated stiffening mold members and their associated receiving grooves extend longitudinally through a portion of the length of the cylindrical mold.

Sub A1 9. A composite drive shaft comprising:

a plurality of elongated stiffening mold members, said elongated stiffening mold members arranged parallel to a central axis; and

composite fibrous material extending around said elongated stiffening mold members in a cylindrical shape to hold said elongated stiffening mold members in place.

10. The composite drive shaft of claim 9, wherein said elongated stiffening mold members have a hat shape.

11. The composite drive shaft of claim 9, wherein said elongated stiffening mold members have a T shape.

12. The composite drive shaft of claim 9, wherein said elongated stiffening mold members have a circular shape.

13. The composite drive shaft of claim 9, wherein said elongated stiffening mold members are removable from the drive shaft to leave structural voids.

14. The composite drive shaft of claim 9, wherein said elongated stiffening mold members extend longitudinally through the full length of the composite drive shaft.

15. The composite drive shaft of claim 9, wherein said elongated stiffening mold members extend longitudinally through a portion of the length of the composite drive shaft.

16. The composite drive shaft of claim 9, wherein said structural voids extend longitudinally through the full length of the composite drive shaft.

17. The composite drive shaft of claim 9, wherein said structural voids extend longitudinally through a portion of the length of the composite drive shaft.

18. A method for making a composite drive shaft, said method comprising the steps of:

providing a cylindrical mold, said cylindrical mold having a plurality of receiving grooves extending parallel to its axis;

applying a first layer of composite fibrous material around said cylindrical mold;

inserting elongated stiffening mold members into said receiving grooves of said cylindrical mold, outside of said first layer of composite fibrous material;

applying a second layer of composite fibrous material around said cylindrical mold, said first layer of composite fibrous material, and said elongated stiffening mold members;

consolidating the drive shaft; and

removing the cylindrical mold from the finished drive shaft.

19. The method of claim 18, further comprising the step of removing the elongated stiffening mold members from the finished drive shaft, leaving structural voids.

20. The method of claim 18, wherein said elongated stiffening mold members and their associated receiving grooves extend longitudinally through the entire length of said cylindrical mold.

21. The method of claim 18, wherein said elongated stiffening mold members and their associated receiving grooves extend longitudinally through only a portion of the length of said cylindrical mold.

22. The method of claim 18, wherein said structural voids extend longitudinally through the entire length of said cylindrical mold.

23. The method of claim 18, wherein said structural voids extend longitudinally through only a portion of the length of said cylindrical mold.

24. The method of claim 18, wherein said receiving grooves and said elongated stiffening mold members are both hat-shaped.

25. The method of claim 18, wherein said receiving grooves and said elongated stiffening mold members are both circular shaped.

26. The method of claim 18, wherein said receiving grooves and said elongated stiffening mold members are both T-shaped.

27. The method of claim 18, wherein the step of applying the first layer of composite fibrous material is accomplished by wrapping at least one pre-impregnated carbon fiber sheet around said cylindrical mold.

28. The method of claim 18, wherein the step of applying the second layer of composite fibrous material is accomplished by wrapping at least one pre-impregnated carbon fiber sheet around said cylindrical mold, said first layer of composite fibrous material, and said elongated stiffening members.

29. An apparatus for use in composite drive shaft construction comprising:

a first layer of composite fibrous material;

a plurality of elongated stiffening mold members, said elongated stiffening mold members positioned on said first layer of composite fibrous material;

and a second layer of composite fibrous material, said second layer of composite fibrous material positioned on said first layer of composite fibrous material and the elongated stiffening mold members.

30. The apparatus of claim 29 wherein the plurality of stiffening mold members are all parallel to the same edge of the first layer of composite fibrous material.

31. The apparatus of claim 29, wherein the edges of said stiffening mold members include stitching extending through both layers of composite fibrous material.

32. The apparatus of claim 29, wherein said elongated stiffening mold members are positioned equidistant from each other.

33. The apparatus of claim 29, wherein said elongated stiffening mold members are hat-shaped.

34. The apparatus of claim 29, wherein said elongated stiffening mold members are T-shaped.

35. The apparatus of claim 29, wherein said elongated stiffening mold members are circular shaped.

36. A method of use for an apparatus for use in making a composite drive shaft, comprising the steps of:

providing a cylindrical mold, said cylindrical mold having a plurality of receiving grooves extending parallel to its axis, and an apparatus for use in making a composite drive shaft;

wrapping said apparatus around said cylindrical mold so that said elongated stiffening mold members in said apparatus fit into said receiving grooves of said cylindrical mold;

consolidating the drive shaft; and

removing said cylindrical mold from the finished drive shaft.

37. The method of claim 36, wherein said receiving grooves and said elongated stiffening mold members are both hat-shaped.

38. The method of claim 36, wherein said receiving grooves and said elongated stiffening mold members are both circular shaped.

39. The method of claim 36, wherein said receiving grooves and said elongated stiffening mold members are both T-shaped.